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ABSTRACT

An instructor's manual and student activity guide on tile setting are provided in this set of prevocational education materials which focuses on the vocational area of trade and industry. (This set of materials is one of ninety-two prevocational education sets arranged around a cluster of seven vocational offerings: agriculture, home economics, distributive education, health occupations, world of work, trade and industry, and office occupations.) The instructor's guide is organized into the following elements: title of activity, duration of activity (three to seven periods), activity goals, seven instructional objectives, related vocational clusters, and activity implementation (description, safety precautions, materials needed, teacher preparation prior to class, during the class, follow-up activities, answer key to student check point activities, and masters for duplication). The student activity guide provides step-by-step instructions (narrative and illustrations) for completing each instructional objective. At the end of each set of instructions is a student check point (evaluation activity). Occupational descriptions for tile setter (construction) and tile setter (manufactured buildings) conclude the document. (JH)

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ED169368

T & I – TILE SETTING

Kit No. 79

INSTRUCTOR'S MANUAL

Prepared by

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1978

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TITLE OF ACTIVITY

Kit No. 79, T & I – Tile Setting

DURATION

Main Activity: 2–5 periods
Follow-up Activity: 1–2 periods

GOALS

Each student will experience the use of tile setting tools and materials. An appreciation of tile work will be developed through each student's awareness of the techniques and abilities required to set tile.

INSTRUCTIONAL OBJECTIVES

Given information about tile and its many uses, each student will identify some of the many uses of tile.

Given appropriate information, each student will identify the correct procedure for setting tile.

Each student will identify the correct application of grout to a tile surface.

Given the proper tools and supplies, each student will construct a wooden base for a tile hot pad.

Given tile and using the wooden tile pad, each student will design a tile pattern.

Given mastic and a trowel, each student will set his/her tile pattern on the board.

Each student will grout and finish her/his hot pad.

VOCATIONAL CLUSTERS

Distributive Education
Agriculture

ACTIVITY IMPLEMENTATION

A. Activity Description

To gain an understanding of some of the tasks involved in tile setting, the student will construct a hot pad using tile. Throughout this activity, the student will perform tasks involving measurements, base preparation, cutting tile, applying tile and grouting (filling in spaces between tile pieces with a cement mixture).

B. Safety

Mastic and tile grout could become a safety problem if not handled carefully. Clean hands and work area after using these materials.

C. Materials Required

1. Audio Visual Equipment
   None
2. Technical Equipment
   13 V-notched trowels
   13 18" rulers (45.7 cm)
   6 hammers
   2 wooden miter boxes
   2 backsaws
   2 crosscut saws
   6 sanding blocks
   6 tile nippers
   12 1- gallon cans (3.79 l)
   6 measuring cups (1 cup=.24 l)
   12 tablespoons (1T=15 ml)
3. Expendable Materials
   2 boxes of tile
   2 qt. cans of mastic (1 qt.=.95 l)
   4 bags of tile grout
   deft (varnish–sealer)
   paintbrush

D. Preparation Prior to Class

Obtain all the expendable materials. Have all the tools required on hand. Duplicate the check sheets and VIEW Fact Sheet. Obtain newspaper to cover worktables to prevent any damage to your classroom.

E. During Class Session

Hand out the Student Activity Guides and Check Sheets. Ask students to work by themselves and to be careful when using any tools that have sharp edges. All students must

have their check sheets signed before proceeding to another objective.

As an introduction to the activity, you may want to read to your class the introduction found in the Student Guide.

F. Follow-up Activities

Have your students complete a VIEW Fact Sheet.

Ask students to list buildings or areas in your community where tile was used in construction.

ANSWER KEY

CHECK SHEET I

1. bathroom
2. swimming pool
3. entry way
4. fireplaces

CHECK SHEET II

1. C
2. D
3. A
4. B
5. F
6. G
7. H
8. E

CHECK SHEET III

1. F
2. G
3. C
4. D
5. E
6. A
7. B

MASTERS FOR DUPLICATION

VIEW Fact Sheet
Check Sheets 1–7

VIEW FACT SHEET

NAME _____ CLASS _____ OCCUPATION _____

A. List the advantages (good points) of this occupation (job).

B. List the disadvantages (bad points) of this occupation (job).

C. List three things you should know to do this occupation (job).
1.
2.
3.

D. What type of education should you get to be prepared (do) for this occupation (job)?

E. What courses must you take to go into this occupation (job)?

F. What do you think your future in this occupation (job) will be?

G. What wage can you expect in this occupation (job)?

H. What are the working hours of this occupation (job)?

I. To learn more about this occupation (job), write to:

J. Using a scale of 1 to 5, circle the number that measures your interest in this occupation (job) as a possible career.

I don't like it. ← 1 2 3 4 5 → I like it.

C

CHECK SHEET I

1. _____
2. _____
3. _____
4. _____

CHECK SHEET II

____	1	A. If board is not smooth, sand off high spots using a block of wood to back sandpaper.
____	2	B. Apply an even coat of mastic. Use a notched trowel.
____	3	C. Make sure the surface is level. Use a ruler or any straight edge to check surface. Scrape or build up as needed to make surface flat.
____	4	D. Hold ruler on board; sight toward a light to see if board is smooth. A crack of light under rule indicates it is not smooth.
____	5	E. Some tile may have built-in 1/8" (.32 cm) spacers. These will be covered with grout.
____	6	F. Raking the mastic is done with the notched side of the trowel. Press down firmly so that the mastic is pushed into ridges as thick as the notches in the trowel.
____	7	G. Each tile is pressed firmly into the mastic and checked for level with a ruler or straight edge. Make sure tile is pressed firmly into mastic.
____	8	H. Spacing is very important for a neat job. About 1/8" (.32 cm) is just right. Many tile setters use a 10 d finish nail for spacing.

CHECK SHEET III

____	1	A. Pour a handful of dry grout mix on the tile and, using a rag wrapped around your finger, clean tile by polishing in a circular pattern. Rub dry grout into the joints to prevent unsightly cracks from appearing as grout dries.
____	2	
____	3	B. When tile is clean, place a damp cloth over the tile and let the grout dry. Keep cloth damp for 72 hours to prevent grout from cracking.
____	4	
____	5	C. Some grout must stand 20 minutes before using, so check the directions closely.
____	6	
____	7	D. Slice up a trowel full of grout and drop it on your tiled surface.
		E. Spread the grout with a piece of cardboard. Press hard enough to squeeze out air bubbles. Push excess along to next tile joint.
		F. To prepare grout, pour about one cup of water in a pail and about 4 cups of dry grout mix. Stir and add more water if too dry or more grout if too sloppy. The desired mix is like wet sand.
		G. Mix grout thoroughly and be sure to scrape sides of pail and bottom corners, as dry grout will pack into corners. Scoop mix up on trowel and let run off to see if it is too thick or too thin.

CHECK SHEETS 4, 5, 6, AND 7

Check Sheet 4 – Instructor's Check _____

Check Sheet 5 – Instructor's Check _____

Check Sheet 6 – Instructor's Check _____

Check Sheet 7 – Instructor's Check _____

T & I – TILE SETTING

Kit No. 79

STUDENT
LEARNING ACTIVITY GUIDE

Prepared by

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TILE SETTING

INTRODUCTION

Tile setting is an interesting occupation. Many persons set tile in interesting patterns as a hobby. Tile setting is a very old occupation as well. Some people feel that the number of degrees in a circle (360°) was arrived at by laying or setting spool tile in a circle.

Tiles are used to protect, to give beauty, to waterproof, to lend a surface and for many other reasons. In this unit we will make a hot pad. We will learn to set tile in a pattern of our choice and to create an article which will provide protection from heat.

GOALS

Each student will experience the use of tile setting tools and materials. An appreciation of tile works will be developed through each student's awareness of the techniques and abilities required to set tile.

DIRECTIONS

Read the material over completely, looking at each picture or drawing before starting construction. Check each tool to be sure you know its name, what it looks like, and how it works.

Also, look at the construction materials and learn their names. Try to come up with some design ideas as you proceed.

After reading the directions, you are ready to start; just follow the instructions step by step.

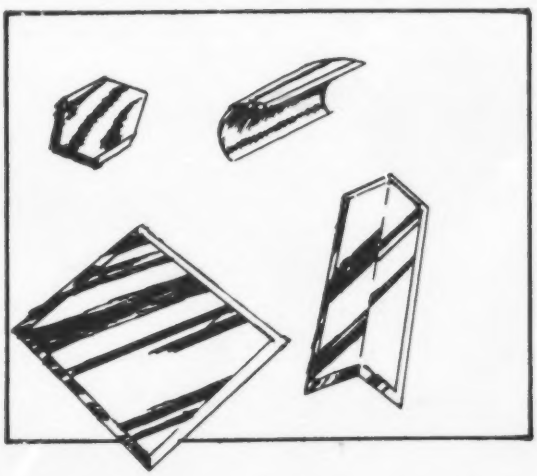
MATERIAL

tile nippers
hammers
ruler
miter box
backsaw
measuring cups
tablespoons (1T=15 ml)
gallon cans (1 gal.= 3.79 l)
grout
mastic
trowel
deft (varnish – sealer)
paintbrush

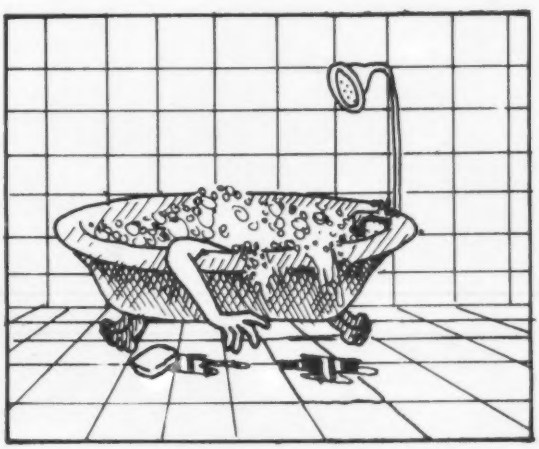
PROGRAMMED TEXT

Instructional Objective 1

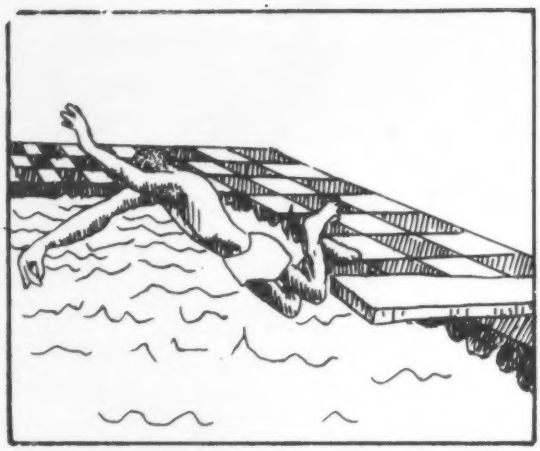
Given information about tile and its many uses, each student will identify some of the many uses of tile.



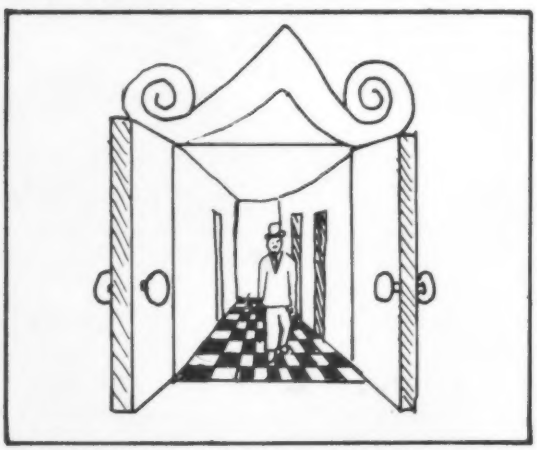
STEP 1 – Tiles are used in many locations. Can you think of some?



STEP 2 – Tile used in a bathroom provides beauty, protection and is waterproof.

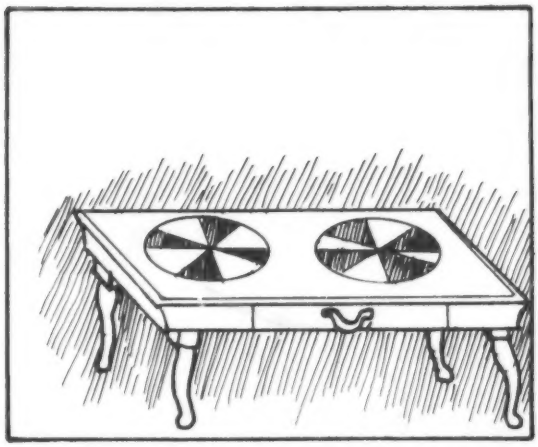


STEP 3 – Tile is used around swimming pools to provide a nonskid surface and for beauty.



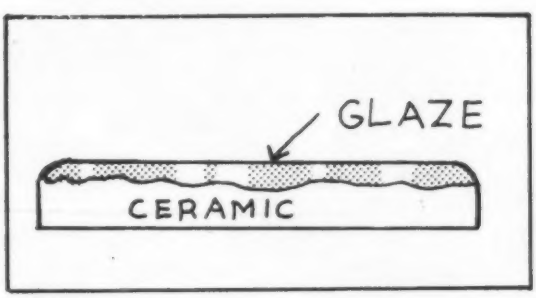
STEP 4 – Many fine homes use tile in an entry way, because water will not hurt it and guests can come right in out of the rain.

STEP 5 – Tile is used on many fireplaces, as it will withstand heat and wear.

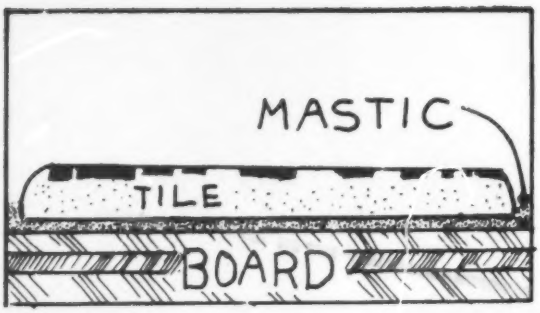


STEP 6 – Tile can be used for its beauty as well as for protection. Notice the beautiful inlaid tile work on this coffee table.

STEP 7 – Tile trivets or hot pads are a work of art and also provide protection when setting hot dishes on tables.

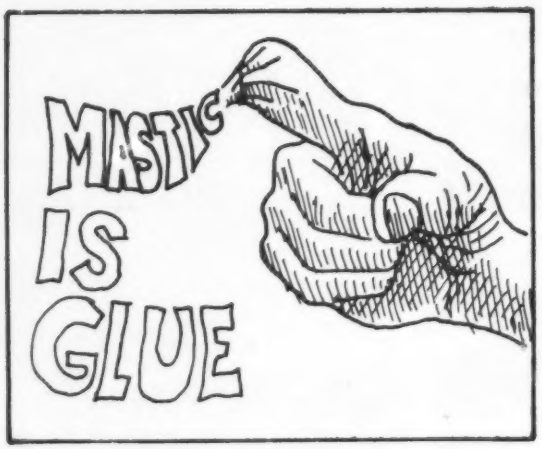


STEP 8 – Tile usually has a glaze coat on one side. This coat is very smooth and has color and perhaps a design in it.



STEP 9 – Tile can be set on almost any surface – plywood, concrete, sheetrock, lathe and plaster, cement blocks or bricks.

STEP 11 – Be sure the mastic you use is for the type surface you are covering.



STEP 10 – Mastic is used to stick tile to walls and floors. It dries into a hard surface. Mastic can blend out some small imperfections in the working surface.

Check Point

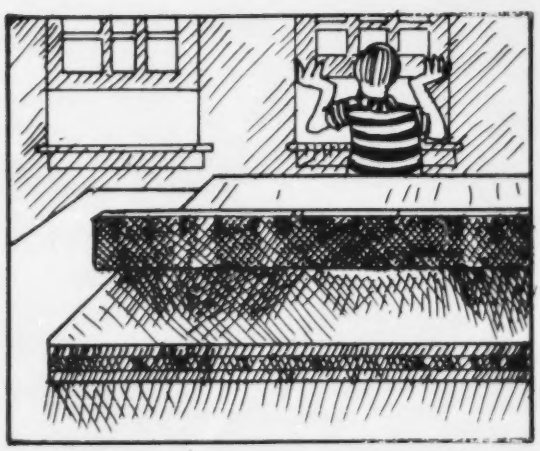
Using Check Sheet I, list 4 uses of tile.

Instructional Objective 11

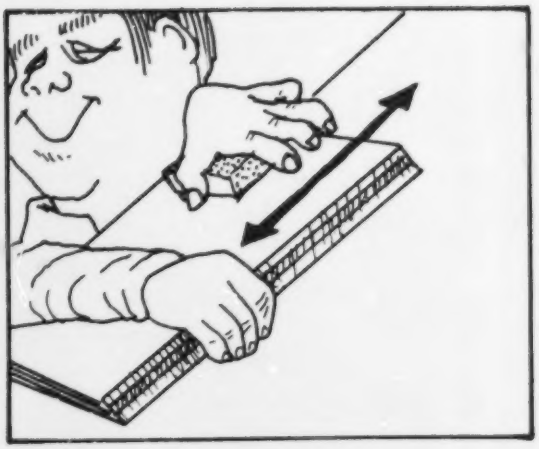
Given appropriate information, each student will identify the correct procedure for setting tile.

1. Level Surface
2. Apply Mastic
3. Apply Tile
4. Grout Tile

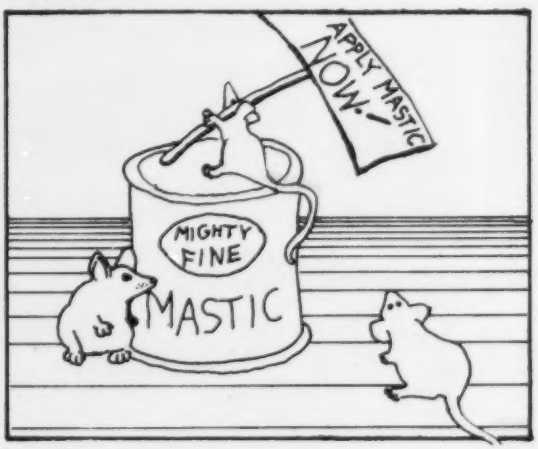
STEP 1 – Make sure the surface is level. Use a ruler, or any straight edge to check surface. Scrape or build up as needed to make surface flat.



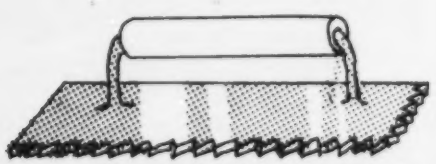
STEP 2 – Hold ruler on board; sight toward a light to see if board is smooth. A ray of light under the ruler indicates it is not smooth.



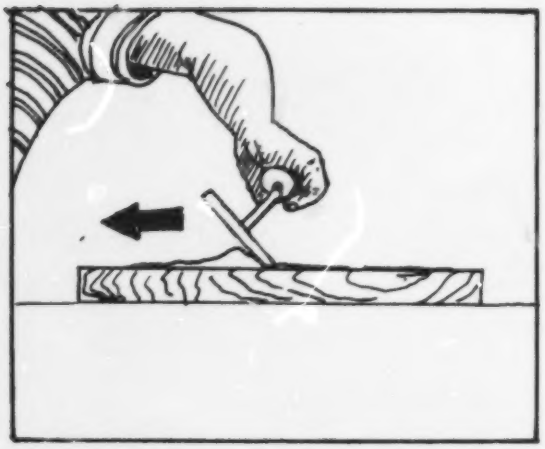
STEP 3 – If the board is not smooth, sand off high spots; use a block of wood to back sandpaper.



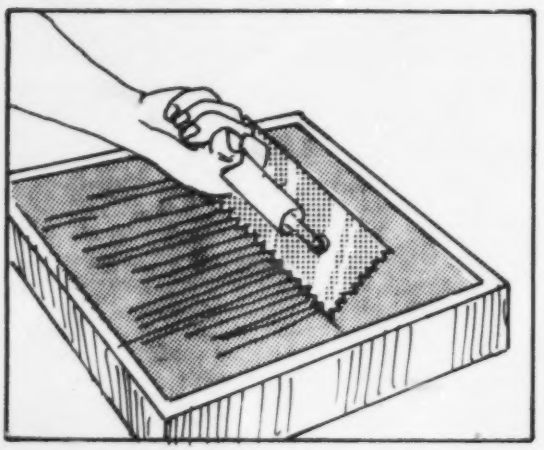
STEP 4 – Apply an even coat of mastic. Use a notched trowel.



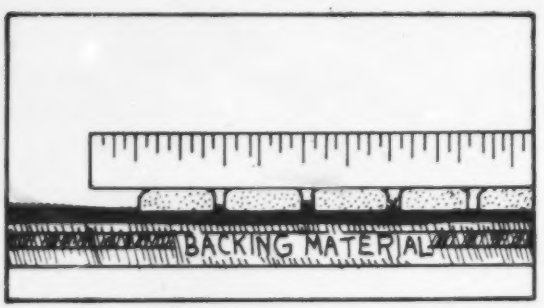
STEP 5 – A notched trowel has V-shaped notches on two sides. This trowel is used to apply the mastic.



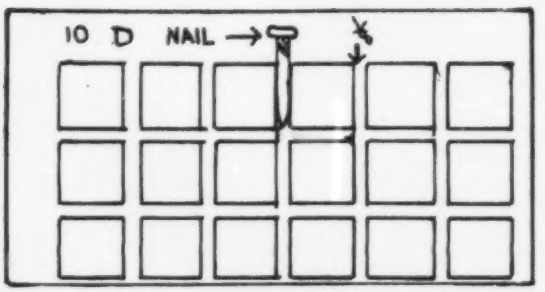
STEP 6 – Slice into the can of mastic with the long, smooth edge of the trowel; spread the mixture evenly and smoothly. Hold the trowel at angle to aid in spreading.



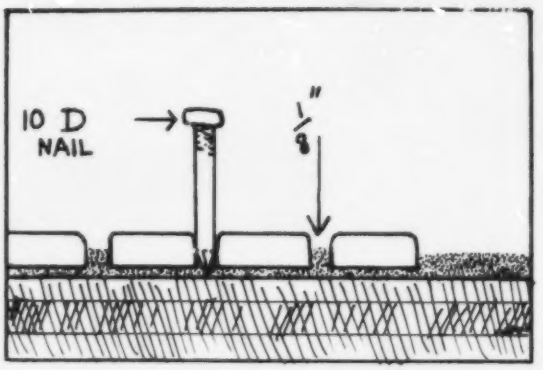
STEP 7 – Raking the mastic is done with the notched side of the trowel. Press down firmly so that the mastic is pushed into ridges as thick as the notches in the trowel.



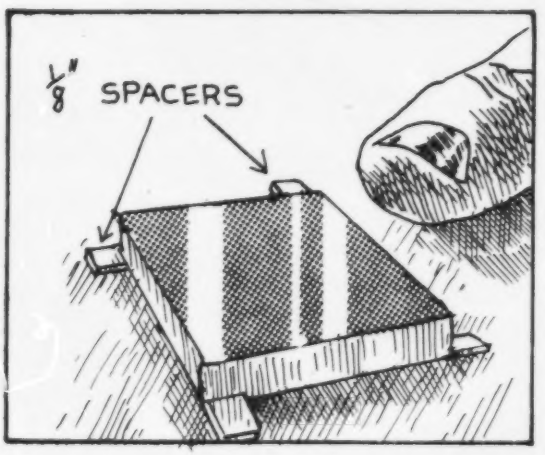
STEP 8 – Each tile is pressed firmly into the mastic and checked for level with a ruler or straight edge. Make sure tile is pressed firmly into mastic.



STEP 9 – Spacing is very important for a neat job. About 1/8" (.32 cm) is just right. Many tile setters use a 10 d finish nail for spacing.



STEP 10 – A nail can be placed between the tiles while they are being set into the mastic.



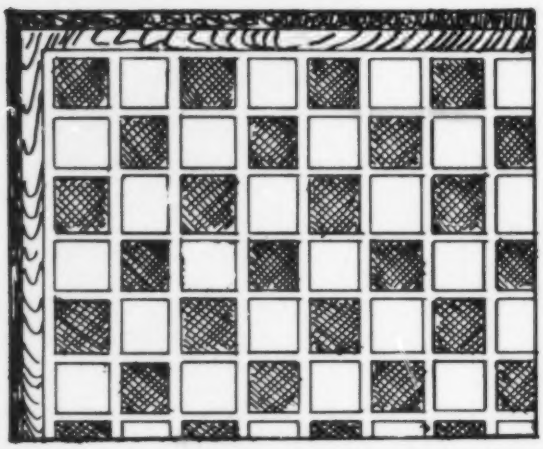
STEP 11 – Some tile may have built-in 1/8" (.32 cm) spacers. These will be covered with grout.

Check Point

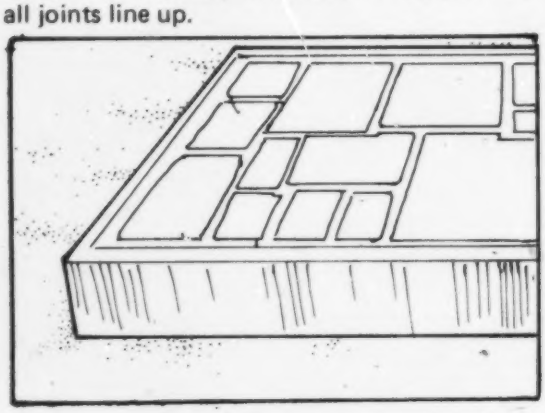
Using Check Sheet II, match the correct letter with the proper sequence in tile setting.

Instructional Objective III

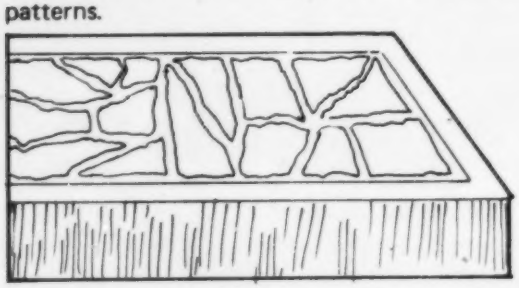
Each student will identify the correct application of grout to a tile surface.



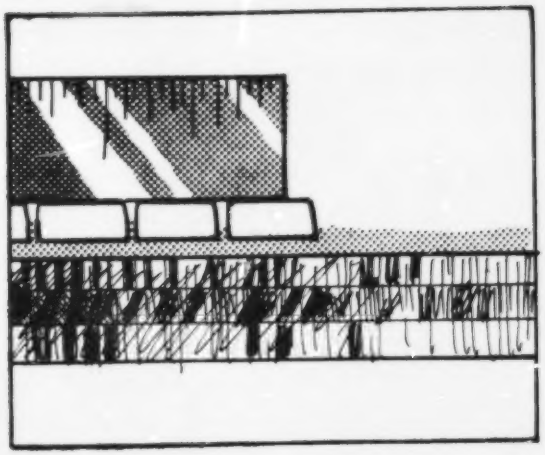
STEP 1 – Tile may be placed in rows so that all joints line up.



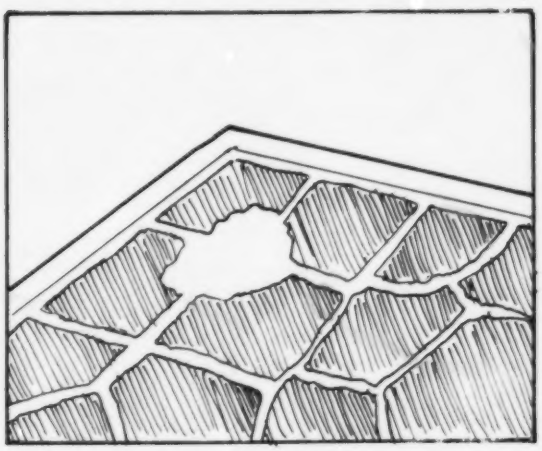
STEP 2 – Tile of different sizes may be used together in various patterns. These patterns are almost endless and need not be repeating patterns.



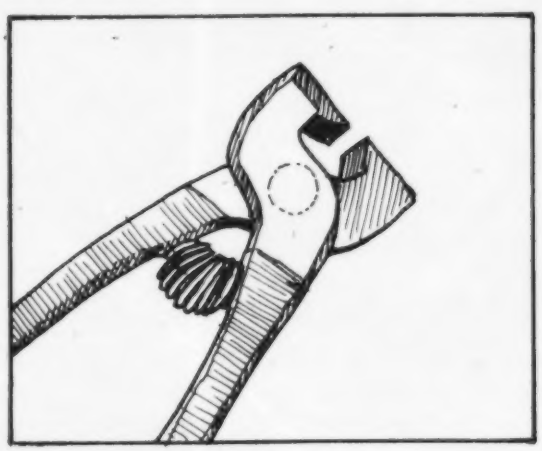
STEP 3 – A tile pattern called "flagstone pattern" can be used with broken tile. Many different colors can be used, as well as different shapes.



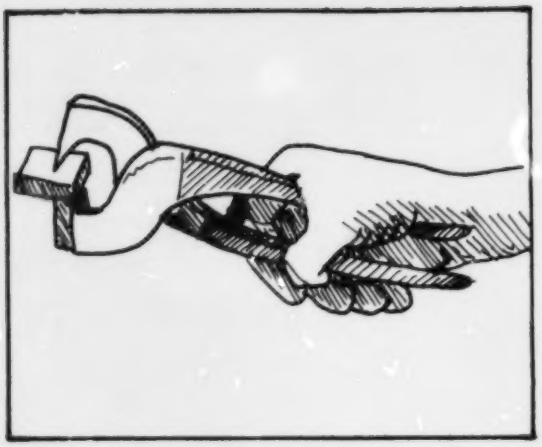
STEP 4 – Keep the tile level on this job also.



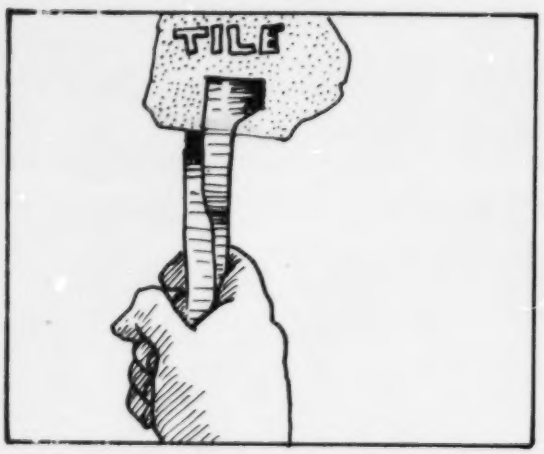
STEP 5 – When the flagstone pattern is used be careful that you do not leave big holes to be filled with grout. A small piece of tile can be put in a hole.



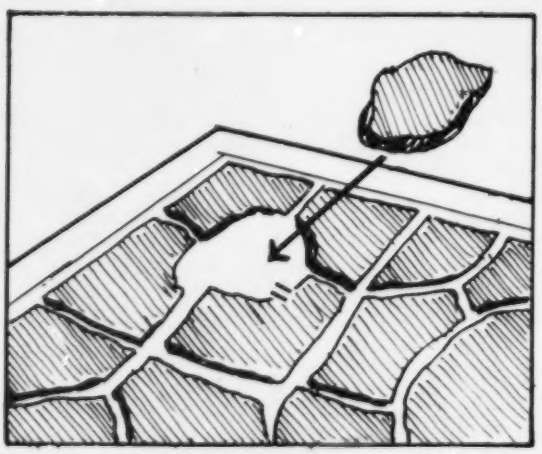
STEP 6 – Tile nippers can be used to cut tile into small pieces and to cut curved shapes.



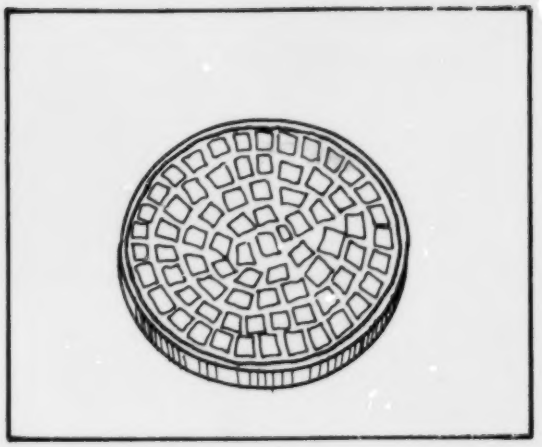
STEP 7 – Pieces can be snipped out with the cutters.



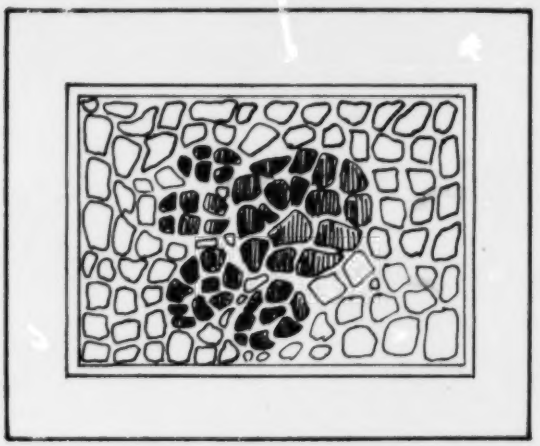
STEP 8 – Save the piece of tile that is cut out to use to fill in the large spaces between tiles.



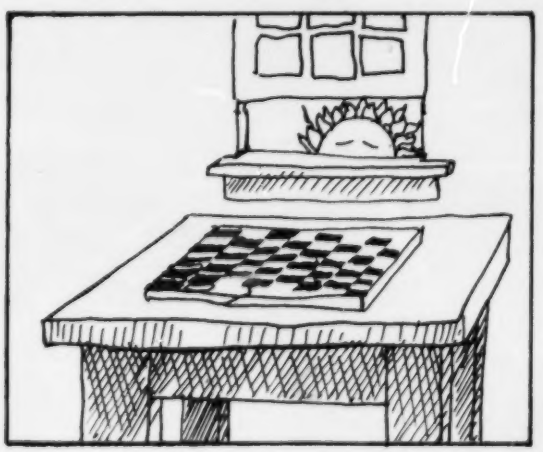
STEP 9 – Fill gaps with pieces of tile that have been cut off.



STEP 10 – Tile can be set in circles to fit a round or square pattern.



STEP 11 – Using different colors and shapes, a design such as a tiger paw can be made.

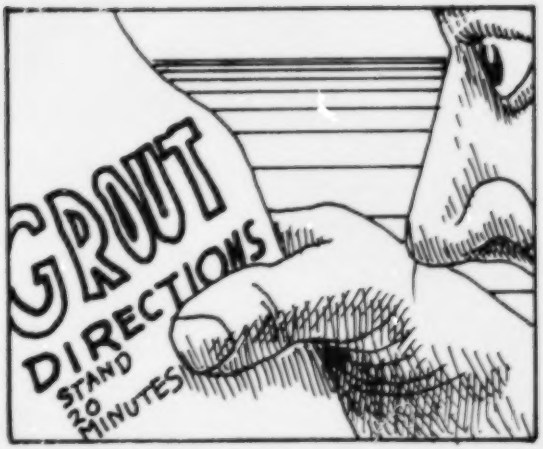


STEP 12 – When tile is placed and level, let it dry for 12 hours or overnight.

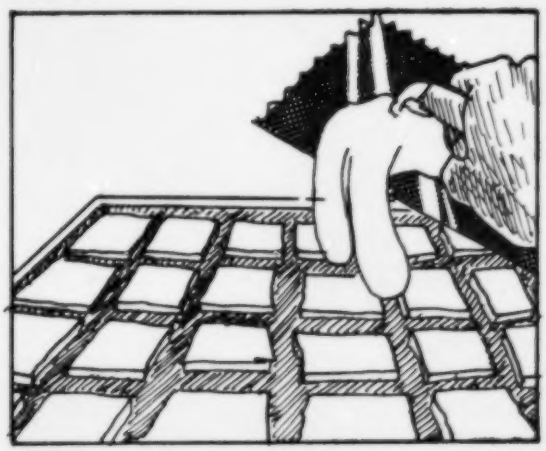
STEP 13 – Grout can be purchased premixed in a bag, just like premixed concrete.

STEP 14 – To prepare grout, pour about one cup of water and about 4 cups of dry grout mix into a pail. Stir and add more water if too dry, or more grout if too sloppy. The desired mix is like wet sand.

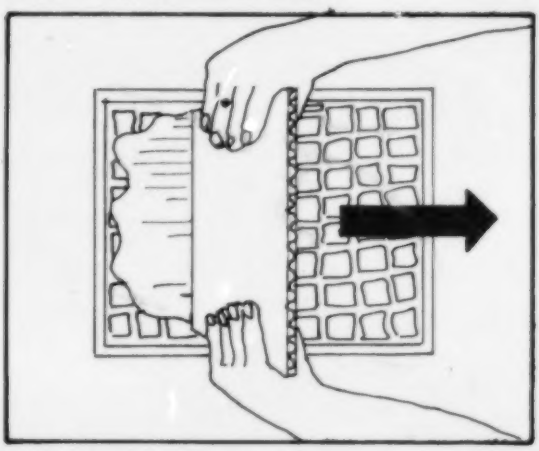
STEP 15 – Mix grout thoroughly; be sure to scrape sides of pail and bottom corners as dry grout will pack into corners. Scoop mix up on trowel and let it run off to see if it is too thick or too thin.



STEP 16 – Some grout must stand 20 minutes before using, so check the directions closely.

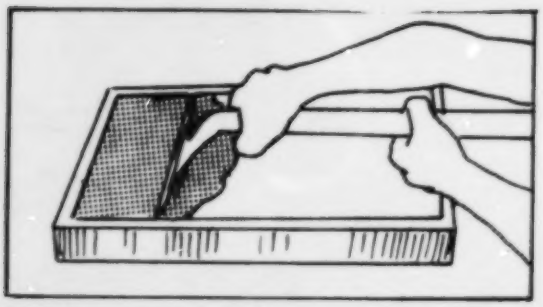


STEP 17 – Slice up a trowel full of grout and drop it on your tiled surface.

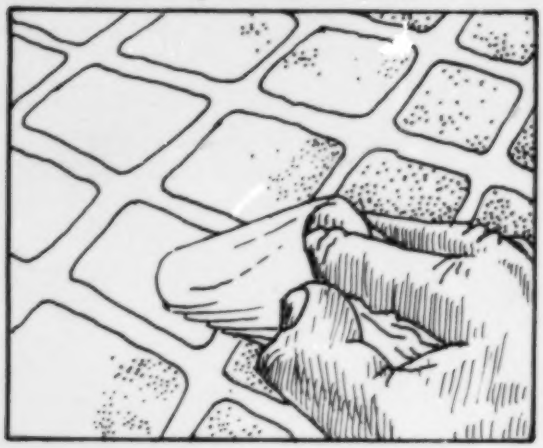


STEP 18 – Spread the grout with a piece of cardboard. Press hard enough to squeeze out air bubbles. Push excess along to next tile joint.

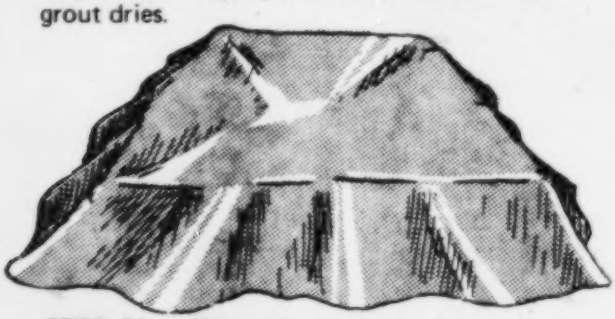
20



STEP 19 – Some professional tile setters use a window-washer's squeeze to move the grout and to press the grout into the joints.



STEP 20 – Pour a handful of dry grout mix on the tile and, using a rag wrapped around your finger, clean tile by polishing in a circular pattern. Rub dry grout into the joints to prevent unsightly cracks from appearing as grout dries.



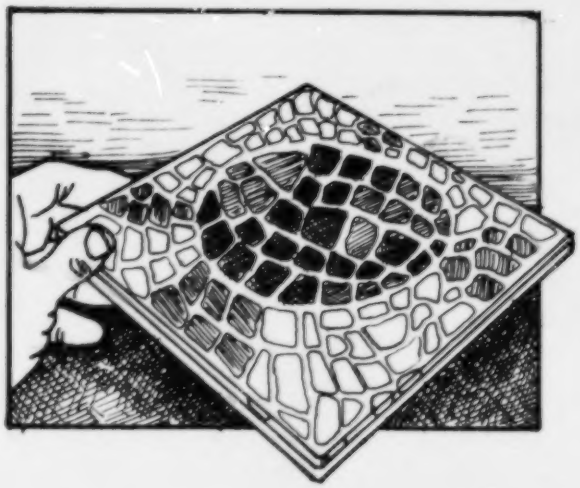
STEP 21 – When tile is clean, place a damp cloth over the tile and let the grout dry. Keep cloth damp for 72 hours to prevent grout from cracking.

Check Point

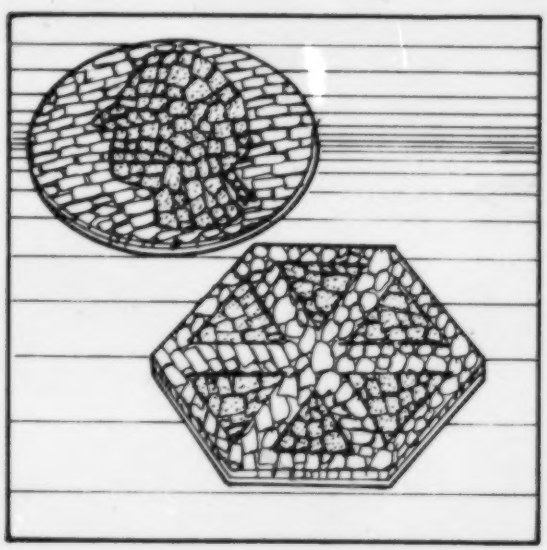
Using Check Sheet III, match the correct letter with the numbered steps to follow in grout application.

Instructional Objective IV

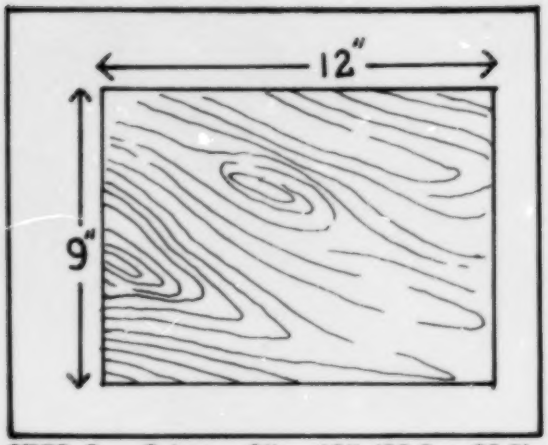
Given the proper tools and supplies, each student will construct a wooden base for a tile hot pad.



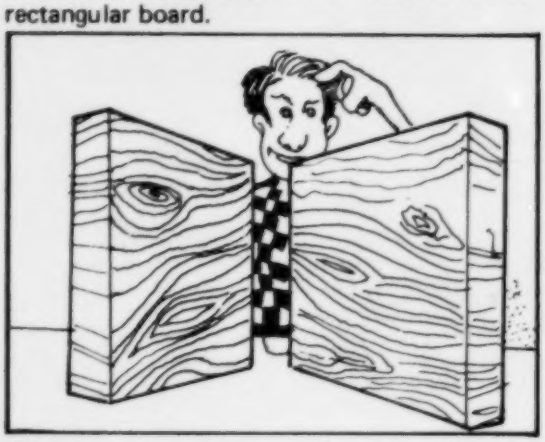
STEP 1 – To learn about tile setting we will make a tile hot pad. We can use it on the table to set hot dishes on.



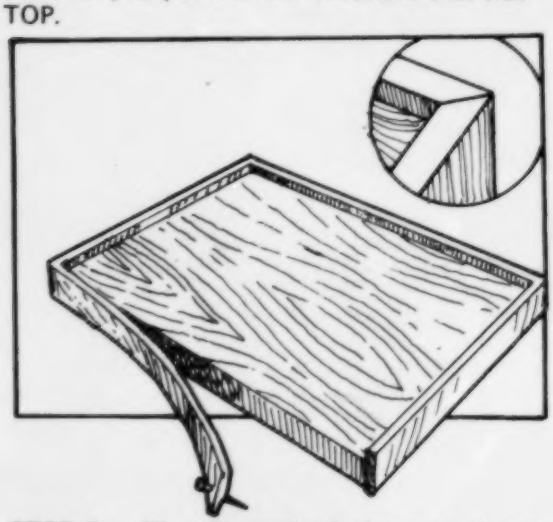
STEP 2 – The hot pad may be square, round or almost any shape. The tiles can be small squares, broken pieces or pieces of different color and different size.



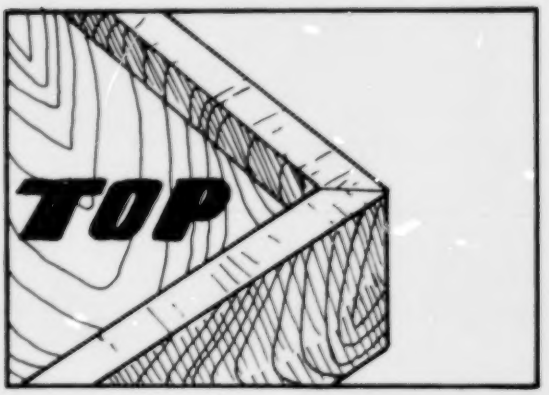
STEP 3 – Select a 9" x 12" (22.8 x 30.5) rectangular board.



STEP 4 – Examine your board and decide which is the worst side. The worst side will be the side you put the tile on. Mark that side TOP.



STEP 5 – We will need a facing around our board and tile. Obtain two 12" (30.5 cm) pieces of wood and two short 9" (22.8 cm) strips of wood. Nail these strips to the edge of the board. Use three no. 4 finishing nails on each strip, so that the corners match. Facing should be even with bottom and should stick up on top side.



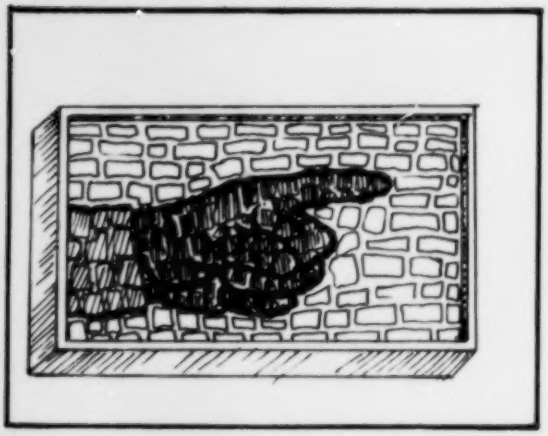
STEP 6 – Your board should look like this. The corners should fit well and the facing should stick up over the top. This will hold the tile on the wood surface.

Check Point

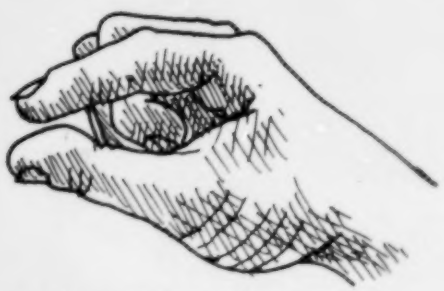
Ask your instructor to inspect your work and sign your Check Sheet IV.

Instructional Objective V

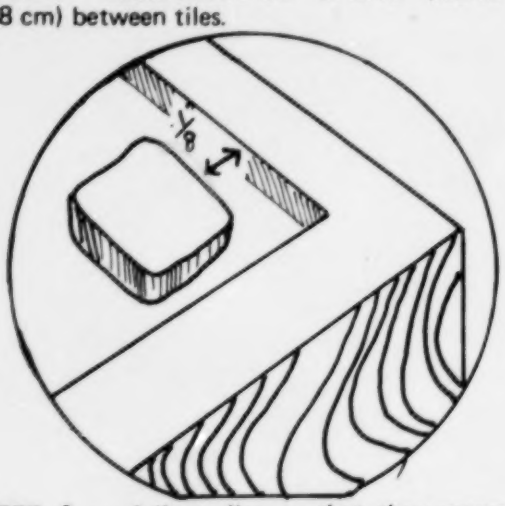
Given tile and using the wooden tile pad, each student will design a tile pattern.



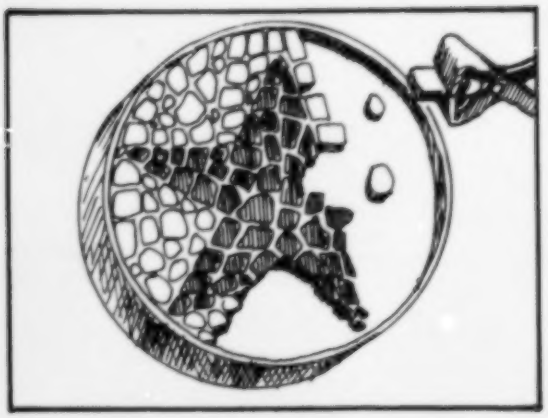
STEP 1 – Pick out the tiles you like and lay them out on your dry board.



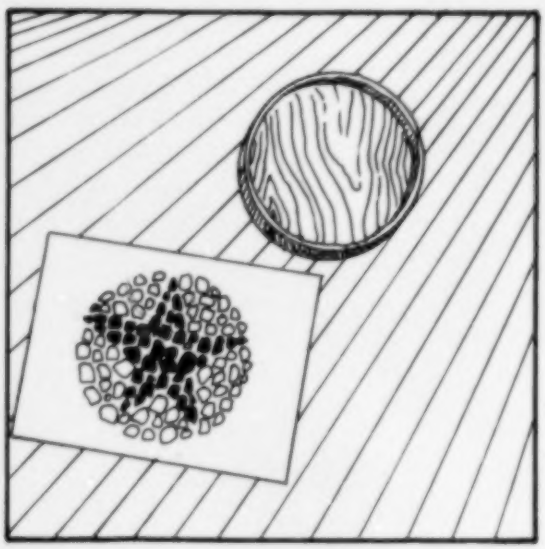
STEP 2 – Leave about 1/8" to 3/16" (.32 to .48 cm) between tiles.



STEP 3 – Adjust tiles so that they come within 3/16" to 1/8" (.48 to .32 cm) of the facing.



STEP 4 – You may need to break tiles to make them fit; use the tile nippers and save the pieces to fill up holes or gaps. Try to keep your joint between 1/8" to 1/2" (.32 to 1.27 cm).



STEP 5 – After you have made your design, move it to a sheet of paper the same size as your board. Lay it out just as you had it on the board.

Check Point

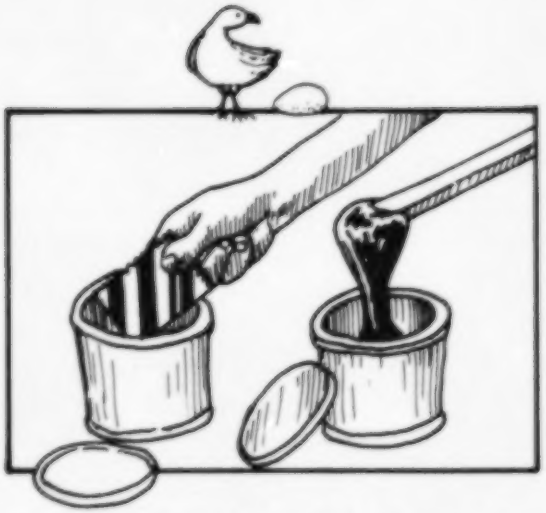
Ask your instructor to inspect your work and sign Check Sheet V.

Instructional Objective VI

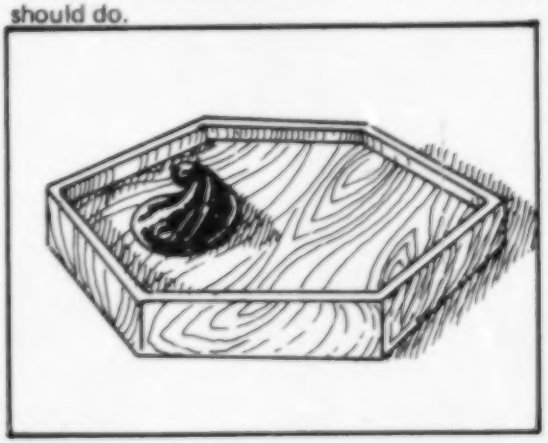
Given mastic and a trowel, each student will set her/his tile pattern on the board.

STEP 1 – Locate the can of mastic; be sure it says it is for use on wood.

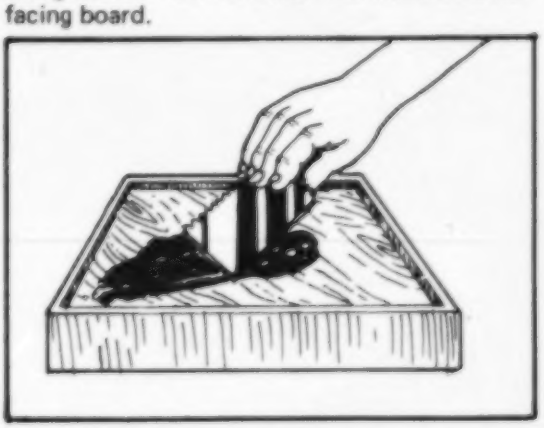
STEP 2 – Locate the notched trowel; it is rectangular with notches on two sides while the other two sides are flat.



STEP 3 – Using the trowel, dig out some mastic – a lump about the size of an egg should do.



STEP 4 – Place the mastic on the board, being careful not to smear the mastic on the facing board.

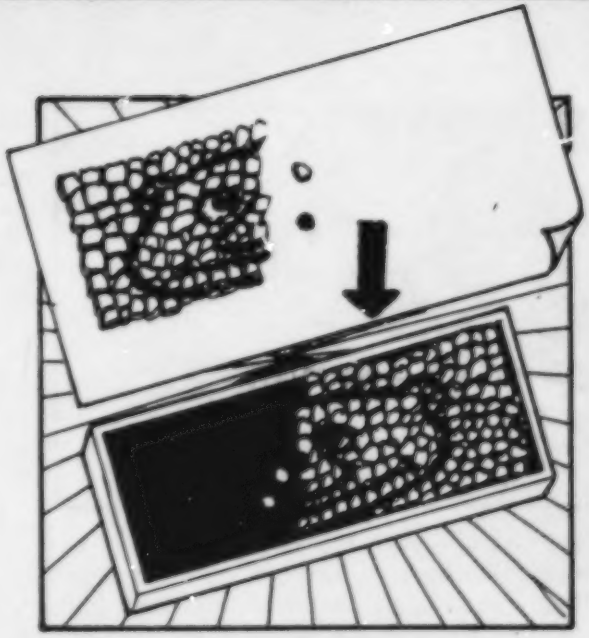


STEP 5 – Using the trowel, very carefully spread the mastic. Use the notched side of the trowel. This will make it just the right thickness. Do not get any mastic on the facing board.

STEP 6 – Make sure mastic is spread evenly; then pick up what is left over, using notched trowel. Tilt it back and it will pick up mastic.

STEP 7 – Scrape excess mastic off trowel and return to can. Wipe trowel well with paper towels. Place used towels in trash can.

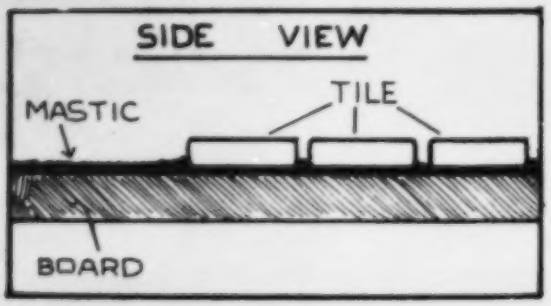
STEP 8 – Check to make sure no mastic is on facing boards. Wipe off excess with a towel wrapped around a stick. If mastic is left to dry on facing, we cannot get the joint spacing we need.



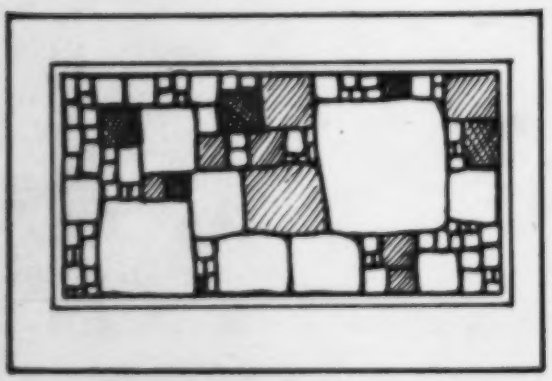
STEP 9 – Now while mastic is still soft, lay in your tile just as you had them on your paper. Do not get any mastic on the tile faces.

STEP 10 – If you get any mastic on your fingers, wipe it off with a paper towel right away so you do not get it on any tile. Put the used towel in the trash can.

STEP 11 – Gently, but firmly, press tile into mastic so that the mastic can get a grip. Push the tile down until you can see the mastic just start to move up in the joint.



STEP 12 – Be careful, when you are pressing tile into mastic, that all are even. Sight across the top.



STEP 13 – When all tile has been placed, check to see that all tiles are still spaced right, all are level, and that there is no mastic on any of the tiles.

STEP 14 – Place aside and let dry for 24 hours or overnight. Be sure board sets flat, as tile will slide if not lying flat.

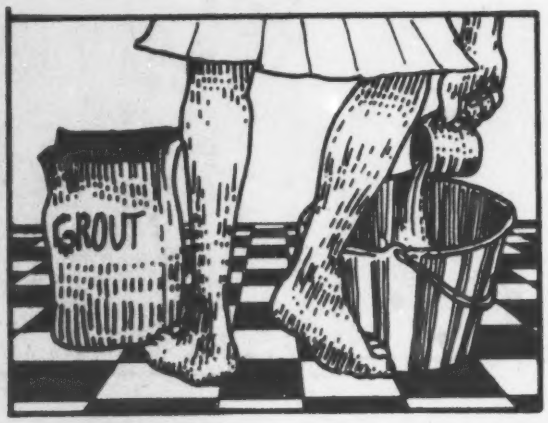
Check Point

Ask your instructor to inspect your work and sign Check Sheet VI.

Instructional Objective VII

Each student will grout and finish his/her hot pad.

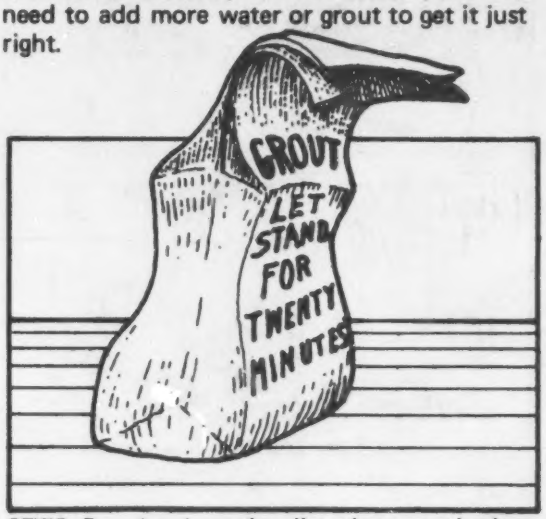
STEP 1 – Obtain the sack of grout, the measuring cup, and the mixing pail.



STEP 2 – Be sure that the cup is dry. Pour 4 cups (1qt. = .95 l) of dry grout mix in the pail.

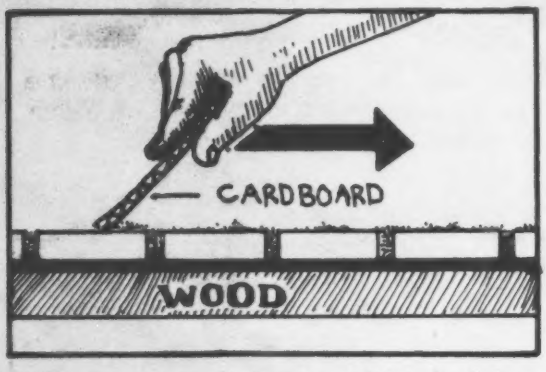
STEP 3 – Add a cup of water a little at a time, mixing with the trowel; be sure to mix the grout around the edges of the pail.

STEP 4 – Stir until the grout is smooth and has the consistency of wet sand; you may need to add more water or grout to get it just right.

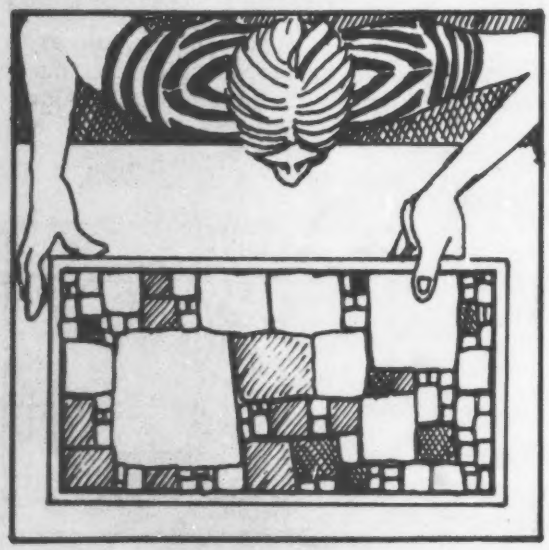


STEP 5 – Look at the directions on the bag of grout. Some grout must stand 20 minutes before it is ready to use.

STEP 6 – Using the pointing trowel, scrape up about a tennis-ball-size lump of grout and place it on the tile.



STEP 7 – Spread the grout into the joint, using a piece of cardboard; add more grout as needed. Press hard enough to pack the grout and force out air bubbles.

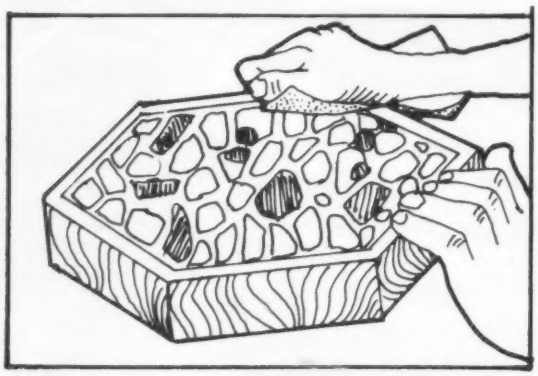


STEP 8 – After excess grout is picked up, look the job over to see if there are any joints you missed. You should have grout between the tile and the facing board.

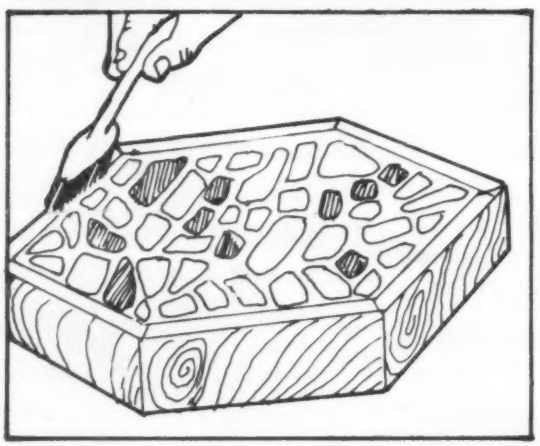
STEP 9 – Notice that there is a film of grout on the tile that we need to remove. Do you remember how to get it off?

STEP 10 – Sprinkle dry grout on the tile and polish it with a coarse cloth, using a circular motion. Try to press the dry grout into the joints. This will prevent cracking as the grout dries.

STEP 11 – Place a damp cloth over the tile and let it set for 3 days.



STEP 12 – Lightly sand the facing board to remove any rough spots or grout that might have stained the wood.



STEP 13 – Using a 1-inch (2.54 cm) brush put a light coat of deft clear finish on the wood. Let dry 3 hours and sand lightly; then apply a second coat of deft.

Check Point

Have your instructor inspect the completed hot pad and sign your Check Sheet VII.

OCCUPATIONAL DESCRIPTIONS

861.381-054 TILE SETTER (const.) tile fitter; tile layer; tile mason.

Applies tile to walls, floors, ceilings, and promenade roof decks, following design specifications: Examines blueprints, measures and marks surfaces to be covered, and lays out work. Measures and cuts metal lath to size for walls and ceilings with tin snips. Tacks lath to wall and ceiling surfaces with staple gun or hammer. Spreads plaster base over lath with trowel and levels plaster to specified thickness, using *screed.* Spreads concrete on subfloor with trowel and levels it with screed. Spreads mastic or other adhesive base on roof deck, using serrated spreader to form base for promenade tile. Cuts and shapes tile with tile cutters and biters. Positions tile and taps it with trowel handle to affix tile to plaster or adhesive base. May be designated according to type of work done as ROOF-PROMENADE-TILE SETTER (const.).

861.684-018 TILE SETTER (mfd. bldgs.)

Lays tile and installs cabinets in bathrooms of manufactured buildings: Selects color of tile according to specification sheet. Lays out sheets of floor tile and cuts backing to fit, using shears. Applies adhesive to subfloor and wall with brush and trowel. Cuts wall tiles to fit around tub fixtures, using hand cutter, and presses tiles into place. Wipes grout between tiles and removes excess with wet sponge. Selects bathroom accessories from stock. Installs and anchors fixtures in designated positions, using handtools.